# W05 Stepwise

01 ★

> ✎ **Fluid force on a triangular plate**
>
> Find the total force on the submerged vertical plate that is an isosceles triangle with (bottom) base 1m and height 2m, and assume it is submerged with the upper vertex 3m below the surface. Liquid is oil with density $\rho = 900\,\text{kg/m}^3$.
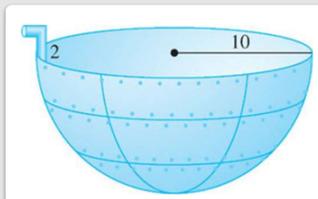
✎ Fluid force on trapezoidal plates

For diagrams 1, 2, 3 (L to R) below, set up an integral to compute the hydrostatic force on the plate.
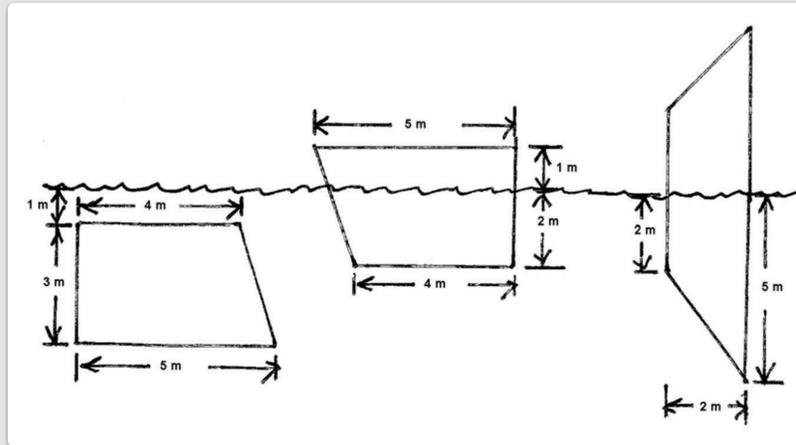
✐ Pumping water from hemispherical tank

A hemispherical tank (radius 10m) is full of water. A pipe allows water to be pumped out, but requires pumping up 2m above the top of the tank.

(a) Set up an integral that expresses the total work required to pump all the water out of the tank, assuming it is completely full.

(b) Now assume the tank start out full just to 6m. What does the integral become?

☑ **Building a conical tower**

Set up an integral that expresses the work done (against gravity) to build a circular cone-shaped tower of height 4m and base radius 1.2m out of a material with mass density 600kg/m^3.